Chapter 3
Bond Markets

Computations

1. The table below gives current information on the interest rates for two two-year and two eight-. year maturity investments. The table also gives the maturity, liquidity, and default risk characteristics of a new investment possibility (Investment 3). All investments promise only a single payment (a payment at maturity). Assume that premiums relating to inflation, liquidity, and default risk are constant across all time horizons.

Investment	Maturity (in Years)	Liquidity	Default Risk	Interest Rate (%)
1	2	High	Low	2.0
2	2	Low	Low	2.5
3	7	Low	Low	r3
4	8	High	Low	4.0
5	8	Low	High	6.5

Based on the information in the above table, address the following:

a) Explain the difference between the interest rates on Investment 1 and Investment 2.

DIFFERENT LIQUIDITY → LIQ. PREMIUM → 0,5%

b) Estimate the default risk premium.

6,5 - 4 - 0,5 = 2%

c) Calculate upper and lower limits for the interest rate on Investment 3, r3.

MIN 4,5%
MAX 4,5%

2. A saver deposits the following amounts in an account paying a stated annual rate of 4%, compounded semiannually:

Year	End of Year Deposits ($)
1	4,000
2	8,000
3	7,000
4	10,000

$4000 \cdot (1+0,02)^6$
$8000 \cdot (1+0,02)^4$
$7000 \cdot (1+0,02)^2$
10.000
$= 30.446,91$

At the end of Year 4, the value of the account is closest to $_____

3. A client invests €20,000 in a four-year certificate of deposit (CD) that annually pays interest of 3.5%. The annual CD interest payments are automatically reinvested in a separate savings account at a stated annual interest rate of 2% compounded monthly. At maturity, the value of the combined asset is closest to:

a) €21,670.

b) €22,890.

c) €22,950.

1. $20.000 \cdot 0,035 \rightarrow 700 \cdot \left(1+\frac{0,02}{12}\right)^{36}$
2. $20.000 \cdot 0,035 \rightarrow 700 \cdot \left(1+\frac{0,02}{12}\right)^{24}$
3. $20.000 \cdot 0,035 \rightarrow 700 \cdot \left(1+\frac{0,02}{12}\right)^{12}$
4. $20.000 \cdot 0,035 \rightarrow 700 + 20.000$

$FV_4 = 743,248 + 728,543 +$
$+ 714,129 + 700 + 20.000 = 22.885,92$

4. $FV_1 = 10.000 \cdot (1-0,01) = 9.900 \rightarrow C_1 = 247,5$

$FV_2 = 10.000 \cdot (1-0,01) \cdot (1-0,02) = 9.702 \rightarrow C_2 = 242,55$

5. $FV_1 = 10.000 \cdot (1+0,01) = 10.100 \rightarrow C_1 = 303$

$FV_2 = 10.000 \cdot (1+0,01) \cdot (1+0,01) = 10.210 \rightarrow C_2 = 306,03$

6. $n = 2$ y
$FV = 1000$
$c = 9\%$
$r = 12\%$

$$P_0 = 152,1046 + \frac{1000}{(1+0,12)^2} = 949,298$$

7. $n = 4$ y
$FV = 1000$
$c = 8\%$
$r = 6\%$

$$P_0 = 247,20 + \frac{1000}{(1+0,06)^4} = 1.069,3$$

8. $$P_0 = 245,8662 + 704,960 = 950,8267$$

9. $$P_0 = \frac{1000\,000}{(1+0,09)^{10}} = 422.410$$

10. $n = 20$ y $\rightarrow 80$
$FV = 1000$
$c = 12\% \rightarrow 0,03$
$r = 16\% \rightarrow 0,04$

$$P_0 = \sum_{i=1}^{80} \frac{30}{(1+0,04)^i} + \frac{1000}{(1+0,04)^{80}}$$

$P_0 = 760,846$

11. $r = -75\%$

$$r_{EXCHANGE} = \frac{0,15-0,13}{0,13} = 0,1538$$

$$r = (1-0,075) \cdot (1+0,1538) - 1 = 0,0643 \rightarrow 6,43\%$$

4. Inflation-Indexed Treasury Bond. Assume that the U.S. economy experienced deflation during the year, and that the consumer price index decreased by 1 percent in the first six months of the year, and by 2 percent during the second six months of the year. If an investor had purchased inflation-indexed Treasury bonds with a par value of $10,000 and a coupon rate of 5 percent, how much would she have received in interest during the year?

5. Inflation-Indexed Treasury Bond. An inflation-indexed Treasury bond has a par value of $1,000 and a coupon rate of 6 percent. An investor purchases this bond and holds it for one year. During the year, the consumer price index increases by 1 percent every six months. What are the total interest payments the investor will receive during the year?

6. Jim purchases 2-years $1,000 par value bonds with a 9percent coupon rate paid annually and a 12 percent yield to maturity. Jim will hold the bonds until maturity. Thus, what is the bond current price?

7. A bond with a $1,000 par value has an 8 percent annual coupon rate. It will mature in 4 years, and annual coupon payments are made at the end of each year. Present annual yields on similar bonds are 6 percent. What should be the current price?

8. A bond with a ten percent coupon rate bond pays interest semi-annually. Par value is $1,000. The bond has three years to maturity. The investors' required rate of return is 12 percent. What is the present value of the bond?

9. Zero coupon bonds with a par value of $1,000,000 have a maturity of 10 years, and a required rate of return of 9 percent. What is the current price?

10. A bond with a 12 percent quarterly coupon rate has a yield to maturity of 16 percent. The bond has a par value of $1,000 and matures in 20 years. Based on this information, a fair price of this bond is $___.

11. Robbins Corp. frequently invests excess funds in the Mexican bond market. One year ago investment provided a yield of -7.5 percent. At the end of the year, when Robbins converted the Mexican pesos to dollars, the peso had depreciated from $.13 to $.15. What is the effective yield earned by Robbins?

True/False Problems

1.The yield to maturity is the annualized discount rate that equates the future coupon and principal payments to the initial proceeds received from the bond offering.
a. True
b. False

T

2.Under the STRIP program created by the Treasury, stripped securities are created and sold by the Treasury.
a. True
b. False

F

3.All private bond placement has to be registered with the SEC.
a. True
b. False

F

4.During weak economic periods, newly issued junk bonds require lower risk premiums than in strong economic periods.
a. True
b. False

F

5.Corporate bonds can be placed with investors through a public offering or a private placement.
a. True
b. False T

6.When a corporation issues bonds, it normally hires a securities firm that targets large institutional investors such as pension funds, bond mutual funds, and insurance companies.
a. True
b. False T

7.Bonds issued by large well-known corporations in large volume are illiquid because most buyers hold these bonds until maturity.
a. True
b. False F

8.The key difference between a note and a bond is that note maturities are usually less than one year, while bond maturities are one year or more.
a. True
b. False F

9.Stripped bonds are bonds whose cash flows have been transformed into a security representing the principal payment only and a security representing interest payments only.
a. True
b. False T

10.A sinking-fund provision is a requirement that the issuing firm retire a certain amount of the bond issue each year.
a. True
b. False T

11.Zero-coupon bonds do not pay interest. Instead, they are issued at a discount from par value.
a. True T
b. False

12.High-risk bonds are called trash bonds.
a. True
b. False F

13.If interest rates suddenly decline, those existing bonds that have a call feature are less likely to be called.
a. True F
b. False

Multiple Choice Problems

Bonds issued by ____ are backed by the federal government.
a. the Treasury
b. AAA-rated corporations A
c. state governments
d. city governments

A variable rate bond allows
a. investors to benefit from declining rates over time.
b. issuers to benefit from rising market interest rates over time. C
c. investors to benefit from rising market interest rates over time.
d. none of the above.

Corporate bonds that receive a ____ rating from credit rating agencies are normally placed at ____ yields.
a. higher; lower
b. lower; lower
c. higher; higher A
d. none of the above

A call provision on bonds normally
a. allows the firm to sell new bonds at par value.
b. gives the firm to sell new bonds above market value.
c. allows the firm to sell bonds to the Treasury. D
d. allows the firm to buy back bonds that it previously issued.

When would a firm most likely call bonds?
a. after interest rates have declined A

b. if interest rates do not change
c. after interest rates increase
d. just before the time at which interest rates are expected to decline

Bonds that are not secured by specific property are called
a. a chattel mortgage.
b. open-end mortgage bonds.
c. debentures. C
d. blanket mortgage bonds.

a. The coupon rate of most variable-rate bonds is tied to:
b. the prime rate.
c. the discount rate.
d. LIBOR or ARRs. D
e. the federal funds rate.

____ bonds have the most active secondary market.
a. Treasury
b. Zero-coupon corporate A
c. Junk
d. Municipal

Which of the following statements is true regarding STRIPS?
a. they are issued by the Treasury
b. they are created and sold by various financial institutions B
c. they are not backed by the U.S. government
d. they have to be held until maturity
e. all of the above are true regarding STRIPS

If interest rates suddenly ____, those existing bonds that have a call feature are ____ likely to be called.
a. decline; more
b. decline; less A
c. increase; more
d. none of the above

Managing in Financial Markets

As an investor, you plan to invest your funds in long-term bonds. You have $100,000 to invest. You may purchase highly rated municipal bonds at par with a coupon rate of 6 percent; you have a choice of a maturity of 10 years or 20 years. Alternatively, you could purchase highly rated corporate bonds at par with a coupon rate of 8 percent; these bonds also are offered with maturities of 10 years or 20 years. You expect that you will not need the funds for five years. At the end of the fifth year, you will sell the bonds since you will need to make a large purchase at that stime.

a. What is the annual interest you would earn (before taxes) on the municipal bond? On the corporate bond? $0,06 \cdot 100.000 = 6.000 \quad \times \; 0,08 \cdot 100.000 = 8.000$

b. Assume that you are in the 20 percent tax bracket. If the level of credit risk and the liquidity for the municipal and corporate bonds are the same, would you invest in the municipal bond or the corporate bond? Why?

$AFTER \; TAX = 8.000 \cdot (1 - 0,2) = 6.400$